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EXAMINER

WALKE, AMANDA C

ART UNIT PAPER NUMBER

1752

5

DATE MAILED: 08/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/851,952

Examiner

Amanda C Walke

Applicant(s)

FEDYNYSHYN, THEODORE H.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 1-17 and 29-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-28 is/are rejected.
- 7) ☒ Claim(s) 18 and 20-28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 4.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## Interview Summary

**Application No.**

09/851,952

**Applicant(s)**FEDYNYSHYN, THEODORE  
H.**Examiner**

Amanda C Walke

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All participants (applicant, applicant's representative, PTO personnel):

(1) Amanda C Walke.

(3)\_\_\_\_\_.

(2) Reza Mollaaghababa.

(4)\_\_\_\_\_.

Date of Interview: 05 August 2002.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: 1-49.

Identification of prior art discussed: N/A.

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The examiner called applicant to make a restriction in the case. The applicant elected group IV, claims 18-28 with traverse.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i) ☒ It is not necessary for applicant to provide a separate record of the substance of the interview (if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

\_\_\_\_\_  
Examiner's signature, if required

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

#### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

##### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

##### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check the appropriate box at the bottom of the Form which informs the applicant that the submission of a separate record of the substance of the interview as a supplement to the Form is not required.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

#### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-7 and 33-49, drawn to a method for reducing linewidth variation in a photoresist, classified in class 430, subclass 270.1, 311.
  - II. Claims 8-16 and 29-32, drawn to a photoresist comprising a polyhydroxystyrene based polymer (aromatic moiety), classified in class 430, subclass 270.1.
  - III. Claim 17, drawn to a photoresist comprising a polyacrylate or polymethacrylate based polymer, classified in class 430, subclass 270.1.
  - IV. Claims 18-28, drawn to a photoresist composition comprising a polycyclic photoresist polymer, classified in class 430, subclass 270.1.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the method of group I could be performed with another conventional suitable photoresist polymer that is sensitive to deep UV radiation (~248 nm wavelength). Additionally, the polymer product could be used in any photolithographic method employing a deep UV exposure step, not just in a method wherein the molar concentration must be what is required by the method of Group I.

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3. Inventions I and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the method of group I could be performed with another conventional suitable photoresist polymer that is sensitive to deep UV radiation (~248 nm wavelength). Additionally, the polymer product could be used in any photolithographic method employing a deep UV exposure step, not just in a method wherein the molar concentration must be what is required by the method of Group I.

4. Inventions I and IV are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the method of group I could be performed with another conventional suitable photoresist polymer composition that is sensitive to deep UV radiation (~248 nm wavelength). Additionally, the photoresist composition comprising the polymer could be used in any photolithographic method employing a deep UV exposure step, not just in a method wherein the molar concentration must be what is required by the method of Group I.

5. Inventions II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different

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functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are claiming structurally different polymers for use in photolithographic methods.

6. Inventions II and IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions the different inventions are claiming structurally different polymers for use in photolithographic methods.

7. Inventions III and IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions the different inventions are claiming structurally different polymers for use in photolithographic methods.

8. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper. The method of group I requires an additional search of the method steps which includes an additional search in subclass 311.

9. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group III, restriction for examination purposes as indicated is proper. The method of group I requires an additional search of the method steps which includes an additional search in subclass 311.

10. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group IV, restriction for examination purposes as indicated is

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proper. The method of group I requires an additional search of the method steps which includes an additional search in subclass 311.

11. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group III, restriction for examination purposes as indicated is proper. In addition to the search in 430/270.1, a structure search of the polymers claimed would need to be performed. The claimed polymers are different enough in structure that two separate structure searches would have to be performed.

12. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group IV, restriction for examination purposes as indicated is proper. In addition to the search in 430/270.1, a structure search of the polymers claimed would need to be performed. The claimed polymers are different enough in structure that two separate structure searches would have to be performed.

13. Because these inventions are distinct for the reasons given above and the search required for Group III is not required for Group IV, restriction for examination purposes as indicated is proper. In addition to the search in 430/270.1, a structure search of the polymers claimed would need to be performed. The claimed polymers are different enough in structure that two separate structure searches would have to be performed.

14. During a telephone conversation with Reza Mollaaghababa on 8/5/2002 a provisional election was made with traverse to prosecute the invention of Group IV, claims 18-28.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-17 and 29-49 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.



### ***Specification***

15. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

The present claims 23 and 28 recite the limitation "...molar concentration ratio... is less than about 1.". The present specification provides motivation on page 5 for a range of the molar concentration ratio of the base relative to the photoacid generator to be at least about 0.2, in a range of from about 0.3 to 0.8, and most preferably in a range of from about 0.4 to 0.6. An endpoint of 1 is not discussed. "About" has been interpreted as meaning within  $\pm 10\%$  of the target, which is the conventionally accepted meaning in the art. Additionally, the Board of Appeals has stated that using "about" allows for amounts, concentrations, etc. slightly above the target or the point in the range (In re Woodruff (CA FC) 16 USPQ2d 1934 (11/20/1990)).

### ***Claim Objections***

16. Claim 18 is objected to because of the following informalities: In line 1, there should be an "a" after "having". Appropriate correction is required.

17. Claims 18 and 20-28 are objected to because of the following informalities: The present claims state "...linewidth variation when *developed* by radiation having a wavelength... ". In conventional lithographic processes, the photoresist pattern is formed by *exposing* the photoresist to radiation then developing the resist. From reading the specification and the present examples, it appears that applicant is using a similar process, so it is believed by the examiner that the claims were meant to state "...linewidth variation when *exposed* by radiation having a wavelength... ". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

18. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

19. Claims 18-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The present claims require that the molar concentration ratio be “at least about” 0.2, 0.4, or 0.6, or be less than about 1. This renders these claims indefinite as there are no clear endpoints for at least about 0.2, 0.4, or 0.6 and no endpoint for less than about 1.

For purposes of examination, the examiner will interpret “less than about 1” as meaning less than 1.1 (for the upper limit of about 1), thus encompassing any molar concentration between about 0.2 and 1.1, and at least about 0.2, 0.4, and 0.6 to include ratios within  $\pm 10\%$  as discussed above in paragraph 15.

***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barclay et al (6,306,554).

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Barclay et al disclose polymers containing oxygen and sulfur alicyclic units for use in photoresist compositions for imaging at short wavelengths (such as 248 nm or less, preferably 200 nm or less [ $\sim$ 193nm], or even as low as 157 nm; column 12, line 65 to column 13, line 4). Preferred alicyclic groups for use in the polymer include norborene groups. The use of such groups on a photoresist composition is advantageous because it results in increased plasma etch resistance, improved substrate adhesion, and the formation of highly resolved relief images. Even more preferred are polymers that consist of the alicyclic units and maleic anhydride units (column 9, lines 42-64 and example 1). The photoresist compositions also comprise a resin binder, a photoacid generator (PAG), a solvent, and a base additive. Preferred PAG's include sulfonate compounds and other known PAG's. Preferred base additives include TBAH, TBAL, and hindered amine compounds (especially preferred for resists imaged at 193 nm), although other conventional compounds may be employed in the invention of the reference. The base additive may be used in small amounts such as about 0.03 wt % to about 5 wt % (column 14, line 52 to 16, line 26 and example in column 21). The prepared compositions are employed in a method of making a pattern by coating the resist onto a substrate, drying the resist, exposing the resist through a mask, post-baking the resist, then developing the resist to form the relief image (column 16, lines 27-67). In the examples of the reference the PAG (triphenylsulfonium triflate) and the base additive (triisopropanol amine) are employed in amounts of 0.52 wt% and 0.03 wt % respectively. When calculated, the molar concentration ratio of the 2 compounds in the example is about 0.1. However, even though there is no broader teaching of the amount of PAG to be added, the base may be added in an amount of from 0.03-5 wt %, it would have been obvious to one of ordinary skill in the art to use any amount within the taught range. The molar

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concentration ratio range based upon the broadest teaching of the base would be about 0.1 to about 20 which would meet the limitations of the present claims which require that the ratio be “at least” about 0.2, 0.4, or 0.6, and the limitation of the present claim 20 requiring that the molar concentration ratio is less than about 1. Therefore it would have been obvious to one of ordinary skill in the art to prepare the material of the reference using any amount of base within the taught range, which results in molar concentration ratio within the range of 0.1 to about 20 that overlaps that required by the present claims, with reasonable expectation of achieving a material having increased plasma etch resistance, improved substrate adhesion, and the formation of highly resolved relief images.

22. Claims 18-21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barclay et al in view of Thackeray et al (5,879,856).

Barclay et al has been discussed above. Although the present claims have been rejected under Barclay et al alone, they are alternatively rejected under Barclay et al in view of Thackeray et al.

Thackery et al disclose chemically amplified resist compositions comprising a resin binder, an acid generator, and a photospeed control agent (base additive) (see abstract). The reference teaches that suitable organic bases or photospeed control agents include TBAH and organic amines. The preferred PAG's include sulfonate salts and onium salts. The photospeed control agent is added in an amount of preferably about 1 % to 20 % by weight of the PAG compound. The resist may be tested for photospeed, and the photospeed can be adjusted to provide a photospeed of a desired value. The photoresist composition will contain a sufficient concentration of the photospeed control agent so that there will be only an about 1-2 % or less

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difference in photospeed exists between batches (column 5, lines 15- 55, column 6, lines 1-7, column 7, line 12- column 8, line 60). The amount of the agent is a result effective variable, therefore given the teachings of the reference, one of ordinary skill in the art would have been motivated to optimize the amount of the photospeed control agent to achieve a desired photospeed value and/or to achieve a more uniform photospeed between batches of photoresist (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)). When calculated, the molar concentration ratio of the examples, which contain 0.131 g of the PAG and 0.013 g of the photospeed control agent, (see column 11) is 0.212. However, even though there is no broader teaching of the amount of PAG to be added, the reference teaches that the photospeed control agent may be added in an amount of from about 1 to 20 % by weight of the PAG. Therefore, it would have been obvious to one of ordinary skill in the art to use any amount within the taught range. The range of the molar concentration ratio would be 0.0212 to 0.42 based upon the broadest teaching of the amount of photospeed control agent, which would meet the limitations of the present claims which require that the ratio be "at least" about 0.2 or 0.4, and the limitation of the present claim 20 requiring that the molar concentration ratio is less than about 1.

Given the teachings of the Thackeray et al reference that the amount of photospeed control agent is a result effective variable and that one of ordinary skill in the art would have been motivated to optimize the amount of the photospeed control agent to achieve a desired photospeed value and/or to achieve a more uniform photospeed between batches of photoresist, it would have been obvious to one of ordinary skill in the art to prepare the photoresist composition of Barclay et al choosing the optimize the amount of photospeed control agent (base additive) in the manner and amount taught by Thackeray et al to achieve the aforementioned advantages,

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with reasonable expectation of achieving a photoresist composition exhibiting in increased plasma etch resistance, improved substrate adhesion, and the formation of highly resolved relief images.

23. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barclay et al in view of Feiring et al (WO 00/67072).

Barclay et al has been discussed above. Barclay et al discusses that the norborene groups may be substituted by non-hydrogen substituents such including groups containing halogens. However, the Barclay et al reference fails to specifically teach a fluorinated alcohol substituent.

Feiring et al disclose a photoresist composition for microlithography in the UV region. The fluorine-containing copolymer a repeat unit derived from at least one ethylenically unsaturated compound characterized in that at least one ethylenically unsaturated is polycyclic. Suitable cyclic moieties include norborene groups. The fluorine group is a fluoroalcohol group, and polymers containing repeat units having these groups exhibit improved development and imaging characteristics (see page 3, line 33 to page 5, line 37 page 9, page 13, and page 14, lines 3-9).

Given the teachings of the Feiring et al reference and the teaching of Barclay et al that the norborene groups may be substituted with groups containing halogens, it would have been obvious to one of ordinary skill in the art to prepare the material of Barclay et al choosing to substitute the norborene groups with a fluorinated alcohol as taught by Feiring et al to improve development and imaging characteristics, with reasonable expectation of achieving a material having increased plasma etch resistance, improved substrate adhesion, and the formation of highly resolved relief images.

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24. Claims 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barclay et al in view of Thackeray et al and Feiring et al.

All three references have been discussed above. Although the present claims have been rejected under Barclay et al in view of Feiring et al alone, they are alternatively rejected under Barclay et al in view of Thackeray et al and Feiring et al.

Given the teachings of the Feiring et al reference and the teaching of Barclay et al that the norborene groups may be substituted with groups containing halogens, it would have been obvious to one of ordinary skill in the art to prepare the material of Barclay et al in view of Thackeray et al choosing to substitute the norborene groups with a fluorinated alcohol as taught by Feiring et al to improve development and imaging characteristics, with reasonable expectation of achieving a material having increased plasma etch resistance, improved substrate adhesion, and the formation of highly resolved relief images.

### ***Conclusion***

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In addition to the prior art cited in the IDS submitted on 11/28/2001, Feiring et al (WO 00/17712), Wallow et al (6,251,560), Barclay et al (6,042,997), and Varanasi et al (6,124,074), are cited for their teachings of photoresist compositions comprising polycyclic polymers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C Walke whose telephone number is 703-305-0407. The examiner can normally be reached on M-R 5:30-4.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Amanda C Walke  
Examiner  
Art Unit 1752

ACW

August 20, 2002

  
JANET BAXTER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700